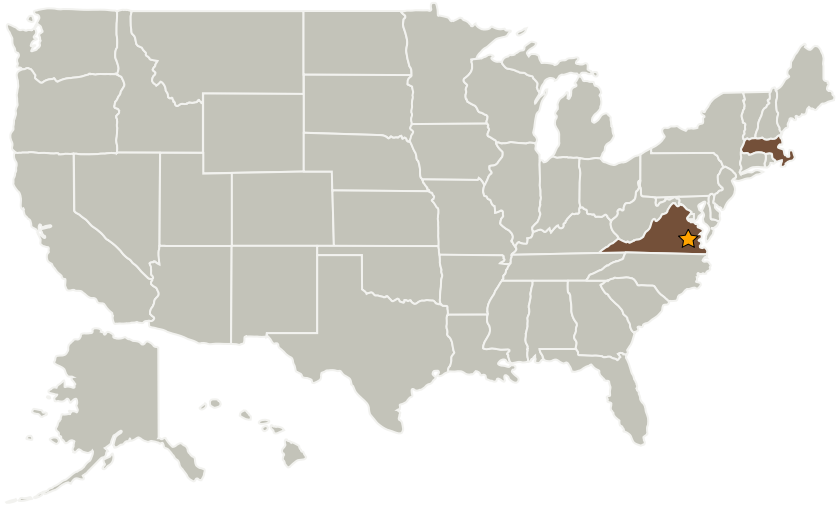
Polyolefin-Nanocrystal Composites for Radiation Shielding, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

EIC Laboratories Inc. is proposing a lightweight multifunctional polymer/nanoparticle composite for radiation shielding during long-duration lunar missions. Isolated nanoparticles homogeneously dispersed throughout the polymer reinforce polymer matrices relative to conventional powder dispersion. This will enable the exploitation of the high hydrogen density of the polyolefin while improving the mechanical and structural properties of polymer composites used in radiation shielding. The goal of this program is to demonstrate that hydrogen dense polyolefins loaded with neutron shielding nanoparticles demonstrate improved shielding and mechanical properties relative to commercially available alternatives. In Phase I, polyolefin/nanoparticle-shielding composites will be fabricated and characterized for thermal, mechanical, and particle dispersion properties relative to commercial products.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
EIC Laboratories, Inc.	Supporting Organization	Industry	Norwood, Massachusetts

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Massachusetts	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.3 Thermal Protection Components and Systems
    - TX14.3.1 Thermal Protection Materials